

HRS RATIONALE SHEET

GROUNDWATER MIGRATION PATHWAY

Likelihood of Release:

GW-1. Observed Release: There is no known evidence to support an observed release to the deep basal aquifer which is the principal groundwater source for the island of Oahu. A score of 0 is assigned.

GW-2. Potential to Release:

- a. Containment: Contaminated soil, no liner. Assigned a containment factor value of 10 from HRS Table 3-2.
- b. Net Precipitation: Assigned a value of 6 from HRS Figure 3-2.
- c. Depth to Aquifer: Depth to shallow groundwater is about six feet below ground surface at the site. The basal aquifer is approximately 600 to 800 feet below ground surface. Assigned a depth to aquifer value of 1 from HRS Table 3-5.
- d. Travel Time: The confining caprock that separates the shallow groundwater from the deeper basal aquifer is made up marine and alluvial sediments having low hydraulic conductivity less than 10^{-8} and the thickness is approximately 600 feet. A value of 1 was assigned using HRS Tables 3-6 and 3-7.

GW-3. Potential to Release calculated to be 80.

Waste Characteristics:

GW-4. Toxicity/Mobility:

Hazardous Substance	Toxicity (T)	GW Mobility (M)	TxM (Table 3-9)
Lead	10,000	2^{-5}	0.2
PCB	10,000	2_{-7}	0.002

The toxicity and mobility values were obtained from the Superfund Chemical Data Matrix (April 1993). The toxicity/mobility factor value was obtained from HRS Table 3-9. The hazardous substance with the highest toxicity/mobility value was lead at 0.2 and this was used as the toxicity/mobility value on the HRS scoresheet.

- GW-5. Hazardous waste quantity: The hazardous waste quantity is not adequately characterized, therefore a default value of 10 is assigned.
- GW-6. Waste Characteristics: Product of items 4 and 5 is 2. Assigned value is 1 (Table 2-7, HRS).

Targets

- GW-7. Nearest Well: There are several drinking water wells within 4 miles of the site. The wells are located upgradient of the site. The closest well is the Kalihi Pump Station and it is between 2 to 3 miles from the site. Hence a value of 3 is assigned (Table 3-11, HRS).
- GW-8. Population: Potential contamination for the population is based on non-karst aquifer and calculations are done on page 3 of scoresheet.
- GW-9. Resources: Several wells exist where the water drawn from the overlying caprock aquifer is utilized for a recreation area (Keehi Lagoon Park). Hence assigned a value of 5.
- GW-10. Wellhead Protection Area: None designated in the State of Hawaii, thus assigned a value of 0.
- GW-11. Targets: Calculated to be 3,436.
- GW-12. Groundwater Migration Pathway Score is calculated to be 3.33 for the basal aquifer.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

DRINKING WATER THREAT

Likelihood of Release

- SW-1. Observed Release: On a site visit by DOH on March 9, 1994, a sheen of a light colored oily substance was observed on the shallow groundwater in an open excavation pit. Since this ground water is where soil was contaminated with PCB's, the sheen could potentially be contaminated with PCB's. Also, samples obtained by the former tenant indicated lead levels up to 3.5 ppm in the groundwater. The groundwater was approximately six feet below the ground surface. Due to the close proximity of Keehi Lagoon Recreational Area (200 feet) and the direct observation of floating product and water samples, a score of 550 is assigned.

SW-2. Likelihood of Release: As there is a direct observation of a release, the potential to release was not assessed and a score of 550 is assigned.

SW-3. Toxicity/Persistence

Hazardous Substance	Toxicity (T)	Persistence (P)	T/P Value Table 4-12
Lead	10,000	1.0	10,000
PCB	10,000	1.0	10,000

The toxicity and persistence values were obtained from the Superfund Chemical Data Matrix (April 1993). The value assigned for T/P is 10,000, the highest value determined for lead and PCB is the assigned T/P value.

SW-4. Hazardous Waste Quantity: Samples collected indicate lead in groundwater up to 3.5 ppm, therefore level II concentrations apply. A default value of 100 is assigned.

SW-5. Waste Characteristics: Calculated to be 32.

Targets

SW-6. Nearest Intake: No intakes from the ocean are utilized for drinking water, thus a value of 0 is assigned.

SW-7. Population: Same as SW-6.

SW-8. Resources: The in-water segment of the hazardous substance migration path is located in a designated water recreation area (Keehi Lagoon). Hence assigned a value of 5.

SW-9. Targets: Calculated to be 5.

Drinking Water Threat Score

SW-10. Drinking Water Threat score calculated to be 1.07.

HUMAN FOOD CHAIN THREAT

Likelihood of Release

SW-11. Likelihood of Release: Same as SW-2.

Waste Characteristics

SW-12. Toxicity/Persistence/Bioaccumulation

Hazardous Substance	T/P (from SW-3)	Bioaccum. Food Chain	T/P/Bioaccum. (Table 4-16)
Lead	10,000	5,000	5×10^7
PCB	10,000	50,000	5×10^8

The bioaccumulation value for food chain threat was obtained from the Superfund Chemical Data Matrix (April 1993). The highest T/P/Bioaccumulation value is for PCB, thus a value of 5×10^8 is assigned.

SW-13. Hazardous Waste Quantity: Same as GW-5.

SW-14. Waste Characteristics: Value calculated to be 320.

Targets

SW-15. Food Chain Individual: As there is an observed release at the site and the fisheries in the area are subject to a hazardous substance with a bioaccumulation factor greater than 500, a value of 20 is assigned.

SW-16. Population: As there is no direct data from fisheries within the target distance, potential human food chain data contamination was assessed (see page 8 of scoresheet). A value of 0.00062 is assigned.

SW-17. Targets: Calculated to be 20.00062.

Human Food Chain Threat

SW-18. Human Food Chain Threat score calculated to be 42.68.

ENVIRONMENTAL THREATLikelihood of Release

SW-19. Likelihood of Release: Same as SW-2.

Waste Characteristics

SW-20. Ecosystem Toxicity/Persistence/Bioaccumulation

Hazardous Substance	Ecosystem Toxicity (salt)	Eco.Tox/P (Tbl.4-20)	Eco.Bioacc. Factor (salt)	Eco/P/Bio Factor (Tbl.4-21)
Lead	1,000	1,000	0.5	500
PCB	10,000	10,000	50,000	5×10^8

Values obtained from the Superfund Chemical Data Matrix (April 1993). The highest Ecosystem Toxicity/Persistence/Bioaccumulation Factor is for PCB, thus 5×10^8 is assigned.

SW-21. Hazardous Waste Quantity: Same as GW-5.

SW-21. Waste Characteristics: Value calculated to be 320.

Targets

SW-22. Sensitive Environment Potential contamination is calculated on page 9 of the scoresheet.

SW-24. Targets: Calculated to be 20.0015.

Environmental Threat Score

SW-25. Environmental Threat Score is calculated to be 42.67.

SW-26. Surface Water Overland/Flood Migration Component Score is calculated to be 86.42.

SOIL EXPOSURE PATHWAY

RESIDENT POPULATION THREAT

Likelihood of Exposure

SE-1. An observed contamination of the soil exists, assigned value is 550.

Waste Characteristics

SE-2. Toxicity: Toxicity factor value for lead is 10,000.

SE-3. Hazardous Waste Quantity: See GW-5.

SE-4. Waste Characteristics: Product of toxicity and waste quantity is 10^5 . Hence assigned value is 18 (Table 2-7, HRS).

Targets

SE-5. Resident Individual: No person lives within the contaminated area or within 200 feet of the site. Hence assigned a value of 0.

SE-6. Resident Population: No resident person exposed to level I or II concentrations. Hence assigned a value of 0.

SE-7. Workers: There are remedial workers on the site itself

as well as a large retail store within 200 feet of the site employee upwards of 100 people. Hence assigned a value of 10.

SE-8. Resources: No commercial agriculture, silviculture, or livestock production/grazing. Hence assigned a value of 0.

SE-9. Terrestrial Sensitive Environments: No sensitive environments located on the contaminated site. Hence assigned a value of 0.

SE-10. Targets: Calculated to be 10.

Resident Population Threat Score

SE-11. Resident Population Score: Calculated to be 99,000.

NEARBY POPULATION THREAT

Likelihood of Exposure

SE-12. Attractiveness/Accessibility: The site is surrounded by a six foot chain link fence, hence assigned a value of 5.

SE-13. Area of Contamination: The area of the contaminated site is 132,000 square feet, hence assigned a value of 40.

SE-14. Likelihood of Exposure: Based on the values of SE-12 and SE-13, a value of 5 is assigned (Table 5-8, HRS).

Waste Characteristics

SE-15. Toxicity: Same as SE-2.

SE-16. Hazardous Waste Quantity: Same as SE-3.

SE-17. Waste Characteristics: Same as SE-4.

Targets

SE-18. Nearby Individual: There are residences within a 1/4 mile of the facility, hence a value of 1 is assigned.

SE-19. Population Within 1-Mile: See calculations on page 18 of HRS scoresheet. Assigned a value of 16.3.

SE-20. Targets: Calculated to be 17.3.

Nearby Population Threat Score

SE-21. Nearby Population Threat: Calculated to be 1,557.

SE-22. Soil Exposure Pathway Score: Calculated to be 1.22.

AIR MIGRATION PATHWAY

Likelihood of Release

AM-1. Observed Release: No observed release via air migration pathway, hence assigned a value of 0.

AM-2. Potential to Release:
Gas Potential - Calculated on page 20 of scoresheet.
Particulate Potential - Calculated on page 20 of scoresheet.

AM-3. Potential to Release: Calculated to be 390.

AM-4. Likelihood of Release: 390

Waste Characteristics

AM-5. Toxicity/Mobility: The toxicity for PCB is 10,000 and the gas mobility factor is 0.02 (Table 6-11, HRS). Assigned a value of 200.

AM-6. Hazardous Waste Quantity: See GW-5.

AM-7. Waste Characteristics: Value assigned is 6 (Table 2-7, HRS).

Targets

AM-8. Nearest Individual: There are individuals within an 1/8 mile of the facility, thus a value of 20 is assigned (Table 6-16, HRS).

AM-9. Population: See HRS scoresheet for calculations.

AM-10. Resources: There is a major recreational area within 0.5 miles of the facility, Keehi Lagoon, thus a value of 5 is assigned.

AM-11. Sensitive Environments: See HRS scoresheet for calculations.

AM-12. Targets: Calculated to be 157.64.

AM-13. Air Pathway Score: Calculated to be 4.47.